

**AMENDMENTS TO THE DRAWINGS**

Please replace the original drawing sheet of FIG. 1 with the enclosed replacement sheet of FIG. 1 labeled "Replacement Sheet." Specifically, the Applicants hereby amend FIG. 1 to include a descriptive label "Turbomachine" for block 10, as requested by the Examiner. This amendment does not add any new matter.

### **REMARKS**

In the Office Action, the Examiner rejected claims 1-4, 51-58, 60 and 61. By this paper, the Applicants hereby amend independent claims 1, 3, 4, 51, 52, 54, and 56; cancel dependent claim 53; and add new dependent claims 62-75 for clarification of certain features to expedite allowance of the present application. These amendments and new claims do not add any new matter. Upon entry of these amendments, claims 1-4, 51-52, 54-58, and 60-75 will be pending in the present application. In view of the foregoing amendments and the following remarks, the Applicants respectfully request reconsideration and allowance of all pending claims.

### **Amendments to the Drawings**

In the Office Action, the Examiner objected to the drawings under 37 C.F.R. §1.84(o)(n), which requires legends on drawings in FIG. 1. The Examiner stated that the generic block 10 should be provided with descriptive labels. In response to these objections, the Applicants have provided a replacement sheet for FIG. 1. The replacement sheet includes a descriptive label "TURBOMACHINE" for the generic block 10 signifying the "turbomachine" discussed in paragraph 25. In view of this amendment, the Applicants respectfully request withdrawal of the foregoing drawing objection.

### **Amendments to the Specification**

The Examiner objected to the Abstract of the disclosure because it contains the word "comprises" at page 44, line 4. Moreover, the Examiner pointed out that the Abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. The Applicants hereby amend the Abstract as set forth above. In view of this amendment, the Applicants respectfully request withdrawal of the Examiner's objections.

### **Rejections Under 35 U.S.C. § 101**

In the Office Action, the Examiner rejected claims 3, 4, 56-58 and 60-61. Although the Applicants respectfully disagree with this rejection, the Applicants hereby amend the preamble of the independent claims 3 and 56 to recite a *computer implemented* method. In addition, each of the independent claims 3, 4 and 56 is hereby amended to recite outputting an indication of the rub to a *computer display* to expedite allowance of the present application. As a result, the Applicants respectfully request withdrawal of the foregoing rejection under 35 U.S.C 101.

### **Rejections Under 35 U.S.C. § 102**

In addition, the Examiner rejected claims 1, 3, 4, 51-58, and 60-61 under 35 U.S.C. § 102(b) as anticipated by Sato et al. (U.S. Patent No. 4,478,082, hereinafter "Sato"). Claim 53 has been canceled. Applicants respectfully traverse the rejections of the rest of the claims.

### ***Legal Precedent***

First, the pending claims must be given an interpretation that is reasonable and consistent with the *specification*. See *In re Prater*, 415 F.2d 1393, 1404-05, 162 U.S.P.Q. 541, 550-51 (C.C.P.A. 1969) (emphasis added); see also *In re Morris*, 127 F.3d 1048, 1054-55, 44 U.S.P.Q.2d 1023, 1027-28 (Fed. Cir. 1997); see also M.P.E.P. §§ 608.01(o) and 2111. Indeed, the specification is "the primary basis for construing the claims." See *Phillips v. AWH Corp.*, No. 03-1269, -1286, at 13-16 (Fed. Cir. July 12, 2005) (*en banc*). One should rely *heavily* on the written description for guidance as to the meaning of the claims. See *id.*

Second, interpretation of the claims must also be consistent with the interpretation that *one of ordinary skill in the art* would reach. See *In re Cortright*, 165 F.3d 1353, 1359, 49 U.S.P.Q.2d 1464, 1468 (Fed. Cir. 1999); M.P.E.P. § 2111. "The inquiry into

how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation.” *See Collegenet, Inc. v. ApplyYourself, Inc.*, No. 04-1202, -1222, 1251, at 8-9 (Fed. Cir. August 2, 2005) (quoting *Phillips*, No. 03-1269, -1286, at 16). The Federal Circuit has made clear that derivation of a claim term must be based on “usage in the ordinary and accustomed meaning of the words amongst artisans of ordinary skill in the relevant art.” *See id.*

Third, anticipation under section 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985). For a prior art reference to anticipate under section 102, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). To maintain a proper rejection under section 102, a single reference must teach each and every limitation of the rejected claim. *Atlas Powder v. E.I. du Pont*, 750 F.2d 1569 (Fed. Cir. 1984). Accordingly, the Applicants need only point to a single element not found in the cited reference to demonstrate that the cited reference fails to anticipate the claimed subject matter. The prior art reference also must show the *identical* invention “*in as complete detail as contained in the ... claim*” to support a *prima facie* case of anticipation. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989).

Fourth, if the Examiner relies on a theory of inherency, the extrinsic evidence must make clear that the missing descriptive matter is *necessarily* present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. *In re Robertson*, 169 F.3d 743, 49 U.S.P.Q.2d 1949 (Fed. Cir. 1999) (Emphasis Added). The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient. *Id.* In relying upon the theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the

allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art. *Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). The Examiner, in presenting the inherency argument, bears the evidentiary burden and must adequately satisfy this burden. *See id.* Regarding functional limitations, the Examiner must evaluate and consider the functional limitation, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. *See* M.P.E.P. § 2173.05(g); *In re Swinehart*, 169 U.S.P.Q. 226, 229 (C.C.P.A. 1971); *In re Schreiber*, 44 U.S.P.Q.2d 1429, 1432 (Fed. Cir. 1997). If the Examiner believes the functional limitation to be inherent in the cited reference, then the Examiner “must provide some evidence or scientific reasoning to establish the reasonableness of the examiner’s belief that the functional limitation is an inherent characteristic of the prior art.” *Ex parte Skinner*, 2 U.S.P.Q.2d 1788, 1789 (Bd. Pat. App. & Inter. 1986).

***The cited reference is missing features recited by independent claim 1, 3, 4, 51, 52, 54 and 56.***

Turning to the claims, the present independent claim 1 recites, *inter alia*, “detecting whether a rub is occurring in the turbomachine between tip portions of the plurality of blades and corresponding seal portions of the turbomachine.” Independent claim 3 recites, *inter alia*, “determining whether a rub is occurring between tip portions of the plurality of blades and corresponding seal portions of the turbomachine.” Independent claim 4 recites, *inter alia*, “determining whether a rub is occurring between tip portions of the plurality of blades and corresponding seal portions of the turbomachine.” Independent claim 51 recites, *inter alia*, “means for detecting whether a rub is occurring in the turbomachine between tip portions of the plurality of blades and corresponding seal portions of the turbomachine.” Independent claim 52 recites, *inter alia*, “a rub detection system configured to ... detect a turbomachine rub event occurring between tip portions of the plurality of blades and corresponding seal portions of the

turbomachine.” Independent claim 54 recites, *inter alia*, “a rub detection system configured to ... detect a turbomachine rub event occurring between tip portions of the plurality of blades and corresponding seal portions of the turbomachine.” Independent claim 56 recites, *inter alia*, “analyzing turbomachine operational data to detect a rub event in the turbomachine ... wherein the rub event occurs between tip portions of the plurality of blades and corresponding seal portions of the turbomachine; and.”

Sato does not teach or suggest that a rub is occurring in the turbomachine between tip portions of blades and corresponding seal portions of the turbomachine, as is generally recited by independent claims 1, 3, 4, 51, 52, 54 and 56. In sharp contrast, the cited reference discloses that “rubbing is occurring at a point R between the rotor and the stator 2 of the rotary machine 1”. Sato, FIG. 1; column 2, lines 56-58. The cited reference further describes the function of locating the source of the rubbing. Referring in general to FIG. 4, the cited reference discloses that if the acoustic sensors 4a and 4b are spaced apart from each other by a distance L on the rotary shaft S of the rotor of the rotary machine 1, and rubbing is occurring at a point R nearer by a distance x to the acoustic sensor 4a than the acoustic sensor 4b from the center of the distance L, then an output waveform of the rotational frequency tuned filter circuit 10b is delayed by a period of time relative to that of the filter circuit 10a as shown in FIG. 5. The cited reference further discloses that by measuring the period of time, the distance x indicating the point R of rubbing occurrence relative to the center of the distance L can be computed. Sato, FIG. 4, 5; column 4, lines 42-61. The Applicants respectfully stress that Sato does not teach or suggest that rubbing is occurring between tip portions of blades and corresponding seal portions of the turbomachine, as is generally recited by claims 1, 3, 4, 51, 52, 54 and 56. In view of these deficiencies, among others, the cited reference cannot anticipate independent claims 1, 3, 4, 51, 52, 54 and 56 and their dependent claims.

For at least these reasons, among others, the Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 102.

**New claims**

As noted above, the Applicants added new claims 62-75, and believe these claims are in condition for allowance. For example, new dependent claims 62, 64, 66, 68, 72 and 74 recite, “the plurality of blades is disposed on the rotor and the corresponding seal portions are disposed on the stator.” Similarly, each of the new dependent claims 63, 65, 67, 69, 71 and 75 recites a combination of various turbomachine operating conditions such as bearing vibration, temperature, pressure, eccentricity, axial displacement, load, and condenser pressure values. The cited reference does not teach or suggest at least the foregoing features of the new dependent claims 62-75. Accordingly, the Applicants respectfully stress that the new dependent claims 62-75 are in condition for allowance.

**Conclusion**

The Applicants respectfully submit that all pending claims should be in condition for allowance. However, if the Examiner believes certain amendments are necessary to clarify the present claims or if the Examiner wishes to resolve any other issues by way of a telephone conference, the Examiner is kindly invited to contact the undersigned attorney at the telephone number indicated below.

Respectfully submitted,

Date: February 6, 2007

A handwritten signature in black ink, appearing to read 'Tait R. Swanson', is written over a horizontal line.

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